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TABLE XI.—*A comparison of data pertaining to dust content of air in different industries.*

Industry.	Observer.	Number of samples.	Dust particles per cubic foot.	Mgs. dust per 100 cubic feet.	Percentage of inorganic solids.
Good polishing shop	Winslow, Greenburg, and Angermyer.	15	207,000	2.37	77
Cigar shops	Miller and Smyth	19	102,600	8.4	56
Pottery	do	5	182,720	13.0	60
Asbestos	do	6	494,100	35.4	73
Steel grinding	do	3	489,930	43.3	96
Flint	do	3	844,040	45.9	76
Blanket, plush, and carpet	do	13	148,950	50.4	44
Joplin mines	Higgins, Lanza, et al	221		146.4	
Abrasive factory "B"	Winslow, Greenburg, and Greenberg.	57	31,010,000	174.3	86
Cement mill	Miller and Smyth	11	6,790,900	218.5	72
Abrasive factory "C"	Winslow, Greenburg, and Greenberg.	9	159,779,000	780.5	87

It will be noted that our figures for factory B are somewhat in excess of those found by Higgins and Lanza for the Joplin mines; and the figures for factory C are greatly in excess of any reported, including the cement mill studied by Miller and Smyth.

It seems obvious from these results that establishments devoted to the manufacture of abrasive materials may present conditions in regard to aerial dust content that can scarcely be equaled in any other industry. The study of such conditions and the devising of adequate means for so controlling them as to protect the workers in this trade from the menace of tuberculosis would seem to invite serious attention.

A DISPOSAL STATION FOR A CAN PRIVY SYSTEM.

By E. B. JOHNSON, Chief Sanitary Inspector, United States Public Health Service, Montgomery, Ala.

The method of ultimate disposal of the human excrement collected from a can privy system is undoubtedly a matter requiring most careful consideration. An improperly located disposal station, by reason of objectionable odors, will certainly become a source of complaint on the part of persons residing in its vicinity; and since a sanitary system of this character is frequently judged by such an objectionable feature, a malodorous disposal station might cause the condemnation of an otherwise adequate and effective system.

Fully as important as a suitable location is the proper equipment and management of the disposal station. When the sense of smell is offended, or hands and clothing of employees are soiled, it can not be expected that the attendants necessary to operate the station will remain. The disposal plant at Montgomery, Ala., represents the more recent advances made by the field forces of the Public Health Service in the determination of methods for the installation and operation of such plants and for that reason it is described in detail.

Location.

For the establishment of the disposal station at Montgomery, a plot of ground 150 feet by 100 feet, located on a bluff overlooking the Alabama River, was selected. The nearest dwellings are approximately 300 feet distant, and there are not more than 20 houses within 700 feet of the station. That the station is well located, however, is indicated by the presence of 3,300 privies, in which 3,900 cans are used, within a radius of 1 mile and a half. By locating the disposal station in the center of the available plat, free ventilation has been secured and a reasonable zone maintained between it and adjoining property.

Capacity of Station.

The chief consideration determining the size of the station was the platform room necessary to accommodate the incoming cans. It was estimated that 4,200 weekly (or 700 daily) would be brought through this station, and the assumption was made that not over 200 of these would arrive at one time. To allow for subsequent expansion of the system, however, all further estimates were based on a possibility of 480 arriving at one time; so that the station has really a potential capacity of over 10,000 weekly. Since the cans are changed once a week, the station could dispose of the excreta from a territory containing 10,000 cans, or could serve a number of houses approximately two and one-half times that in the present allotted territory.

Arrangement.

In order to provide space for the 480 cans which might possibly be unloaded at one time, it was decided to build an unloading platform 30 feet by 7 feet, and on the opposite side of the station a loading platform of the same size. Each of these platforms was designed to hold 480 cans in stacks four tiers high. To provide sufficient room in which to work around the hoppers, a space 6 feet wide, running the entire length of the building, was allowed for them between the two platforms. Thus the entire station, when completed, was 30 feet long by 20 feet wide. In figure No. 1 are shown a floor plan of the station (A) and an end elevation (C).

Construction.

The station was built on brick pillars which were placed 5 feet apart and which were of sufficient height to bring the floor from 2½ to 3 feet higher than the driveway. This permits the easy handling

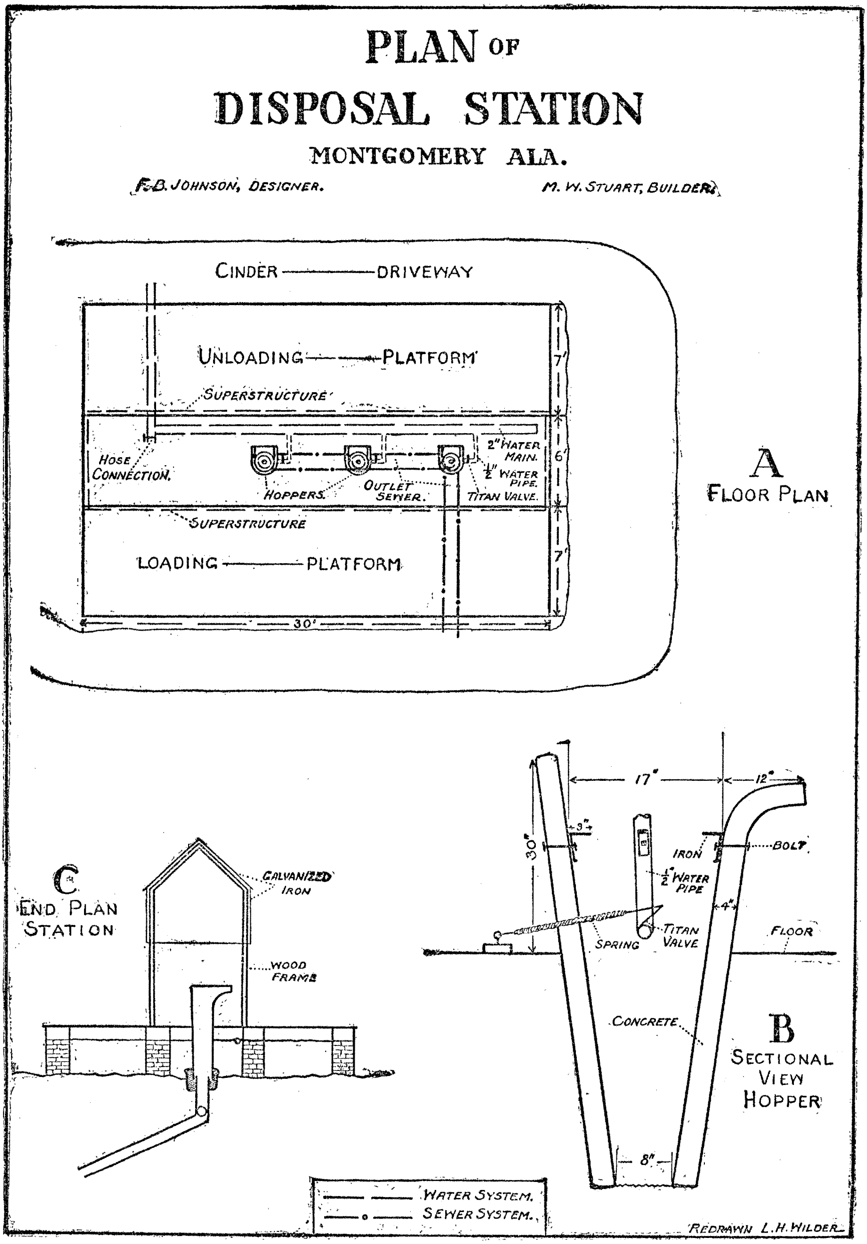
PLAN OF
DISPOSAL STATION
MONTGOMERY ALA.
F. B. JOHNSON, DESIGNER.
M. W. STUART, BUILDER.
CINDER DRIVEWAY
UNLOADING PLATFORM
SUPERSTRUCTURE
HOSE CONNECTION.
HOPPERS.
OUTLET SEWER.
2" WATER MAIN.
½" WATER PIPE.
TITAN VALVE.
SUPERSTRUCTURE
LOADING PLATFORM
7'
6'
7'
30'
A
FLOOR PLAN
C
END PLAN
STATION
GALVANIZED IRON
WOOD FRAME
17"
12"
3"
30"
IRON
BOLT
½" WATER PIPE
4"
TITAN VALVE
SPRING
FLOOR
CONCRETE
8"
B
SECTIONAL
VIEW
HOPPER
WATER SYSTEM.
SEWER SYSTEM.
REDRAWN L.H. WILDER

FIG. 1.

of the cans between the wagons and the platforms. The stringers were 4-inch by 6-inch timbers, and the flooring was made of 2-inch boards. The building proper is 12 feet high at the ridge and 9 feet at the eaves. Corrugated galvanized sheeting was used.

As originally designed, only the central portion of the station, 6 feet in width, was covered by a roof. In building, this plan was adhered to for the purpose of obtaining thorough ventilation and ample light. Experience has shown, however, that a better plan would be to extend the roof over the entire platform. The attendants need shelter in stormy weather, and the station equipment should be protected against theft and depredation. Figures 1, 2, and 3 illustrate the present arrangement. A roadbed of cinders was laid from the street to and around the station.

Hoppers.

The most important and interesting feature of the disposal station is the means by which the excrement is removed from the cans. Three concrete hoppers are used (figs. 4, 5, and 6). A brief description of one of these disposal hoppers will serve to explain the manner in which it is operated.

The hopper has the shape of an inverted frustum of a cone with a lip extending 12 inches toward the unloading platform. The lip is U-shaped, concave upward, and the inside middle point is about 7 inches below the top of the hopper (fig. 6 shows the forms used in the construction of the hoppers). On the inner wall of the hopper, and level with the inside bottom of the lip just described, 4 pieces of right-angle iron are placed at equidistant points. One side of each angle iron is fastened to the inner concrete wall by bolts, while the other sides project 3 inches into the interior of the hopper, thus forming projections which support an inverted can. The diameter of the hopper at this point is 17 inches, while the cans in which excreta are collected have a diameter of 15 inches, giving a leeway of 2 inches when the can is in position on the iron supports. The concrete hopper narrows down gradually until it connects with an 8-inch sewer. This sewer discharges its contents, without treatment, directly into the Alabama River.

The apparatus for washing cans is simple. Projecting into the center of the hopper, and to a point 2 inches above the angle-iron supports previously described, is a half-inch perpendicular pipe. The flow of water through this pipe is controlled by a titan valve located to the left and immediately outside of the hopper. Ordinarily, the valve is kept closed by a spring (fig. 1, B). It is opened by moving the lever, and is kept open during the washing operation either

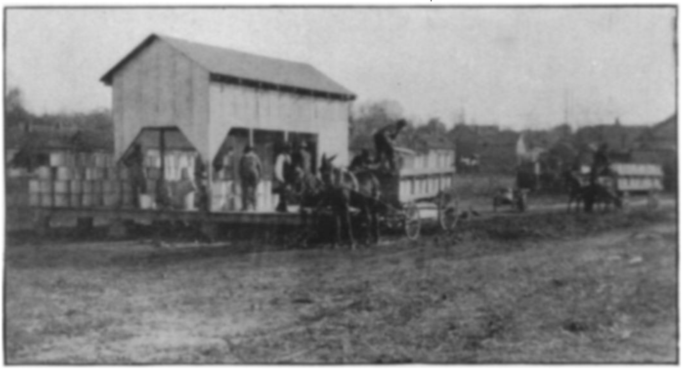

FIG. 2.

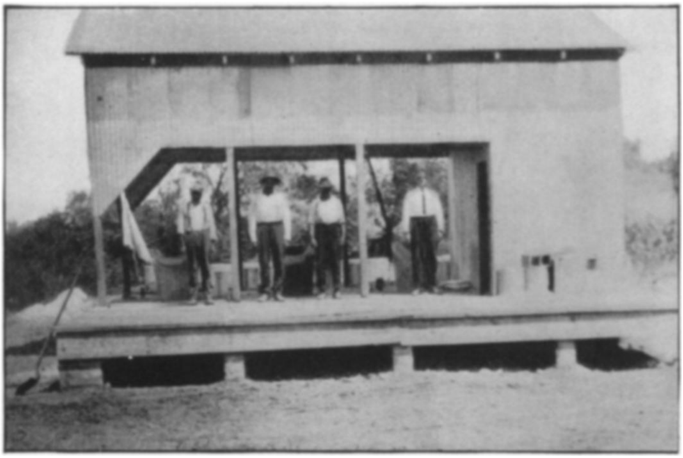

FIG. 3.

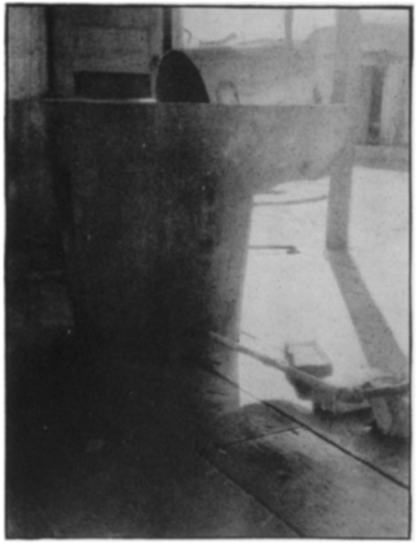

FIG. 4.

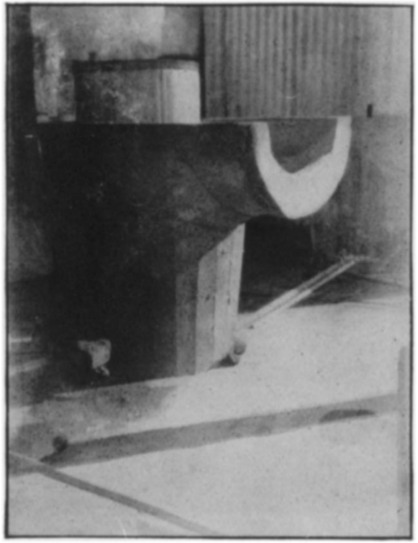

FIG. 5.

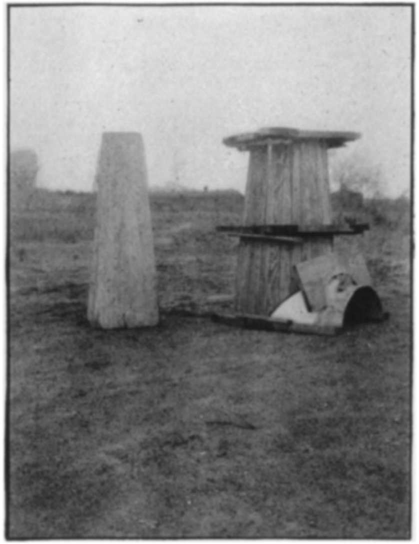

FIG 6.

by foot pressure of the operator or by a weight placed on the lever. The washing pipe is connected to a 2-inch pipe fed by the city mains.

Operation of the Station.

On bringing a load of used cans to the disposal station, each wagon is driven alongside the unloading platform, where the work of unloading is performed by the driver of the wagon and his two helpers. After the cans have been unloaded, the wagon is driven around to the opposite or loading platform, where the same number of clean cans are placed on the wagon by the same employes.

The actual handling and cleaning of the cans at the hoppers is performed by two station employes who operate under the direction of a foreman. One man operates on the "soiled can" side placing the cans in the hoppers, while the other, operating on the opposite side, removes and places them on the "clean can" platform. The man handling the soiled cans loosens the lid, which is dropped onto the platform topside down, and lifts the can to the lip of the hopper. It is then quickly inverted over the washing pipe and the greater portion of the contents falls into the hopper. The can now being in position for washing, the valve is opened and the half-inch stream of water turned on. The water is allowed to flow for from 40 to 60 seconds, after which time it is shut off by the operator on the loading side and the can removed. In practically every instance a single operation cleans the cans satisfactorily, since only in about 1 per cent of the cases do feces adhere to the inner surfaces after the washing. In such cases this material is loosened by applying a solution of lye by means of a mop. Despite certain apprehensions regarding the possible deleterious action of the lye upon the galvanized surfaces it has been found that no damage has resulted.

A measure not in use at this station, but which has been employed quite generally, is that of immersing the cans, after mechanical cleaning, in a tank of disinfectant solution (such as 1–50 compound cresol solution), leaving about a pint of the solution in the can.

The covers previously upturned on the platform are washed by directing upon them a stream from an ordinary hose.

The comparatively slight odor prevailing at the disposal station, even during the unloading and the cleaning operations, has been a matter for much favorable comment. This is due to the fact that all dirty cans are kept tightly covered until they are ready to be placed into the washing hopper. Then, too, the rapidity with which they are handled and the thoroughness of the washing contribute to this favorable result. The process is greatly simplified by the fact that the outer surfaces of the cans seldom become soiled.

Cost of the Station and Its Operation.

The disposal station was erected during the war, at a time when the cost of labor and materials was unusually high. Even so, it does not appear that the expense of construction and maintenance has been disproportionate to the success which has attended the project. The items of expense connected with the erection and operation of the main disposal station may be briefly summarized as follows:

Cost of construction:	
Plat of ground	$1,500.00
Station and hoppers	768.40
Sewer, water pipes, and fixtures	931.60
Total	3,200.00
Cost of operation (daily):	
Foreman	4.50
2 laborers, at $2.50	5.00
Total	9.50

This force handles 700 cans daily, and it could, if necessary, care for 1,200 cans in the same time.

Suggestions for Improvement.

While the present station has served very well the purpose for which it was intended, certain improvements are contemplated which are also to be incorporated in the plans of another station soon to be constructed.

These changes are:

1. A concrete floor with a center drain.
2. A roof over the entire building.
3. Inclosed sides for the building so that the laborers may be protected in stormy weather and the property protected from theft. Sliding or roller doors should be used, thus permitting free ventilation while cans are being discharged or washed.

The disposal station has been in continuous operation in Montgomery for a period of six months. In that time a large number of service cans have been cleaned expeditiously and with practically no objection from persons either working at the station or residing in the neighborhood. From a mechanical as well as from a sanitary standpoint, in which it is an important factor in the prevention of disease, the station has come to be regarded by the community as a successful part of an important system.